Section-1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1 Identification of the substance/preparation:

Commercial name: DI ETHYLENE GLYCOL (DEG)

Chemical name: DI ETHYLENE GLYCOL (DEG) C4-H10-O3

Synonyms: 2-hydroxyethyl ether, Glycol Ether, 2,2'-Oxydiethanol , Diglycol, Digol, Dicol, Ethylene diglycol

1.2 Use of the substance /preparation:

Used in Unsaturated Polyester Resins, Coolants, Pesticides, Rubber Compounding, Plasticizer, Polyurethane Foams, Textile Auxiliaries, Polyethylene Glycols, Paints, brake fluids, etc. Use in polyester resins and polyurethanes, antifreeze blends, triethylene glycol, morpholine, natural gas dehydration, and in solvents.

1.3 MANUFACTURER & SUPPLIER: Reliance Industries Limited

Emergency Coordination Centre contact details:

Hazira Mfg. Division Village Mora, Dist Surat, Gujarat, India	SSM Office	+91 2614135050 / +912614135056 +912616635050/+912616635056
Dahej Mfg. Division Po Dahej 392130 Taluka: Vagra Dist: Bharuch, Gujrat, India	SSM Office	+91 2641 356021 /+91 2641356022
Jamnagar Mfg. Division Village Meghpar / Padana, Ta Lalpur, Dist. Jamnagar, Gujarat	SSM Office	+ 91 288 6612400 + 91 288 6611190/1/6

SSM: Site Shift Manager

Section 2 – HAZARD IDENTIFICATION

2.1 Classification of the substance/preparation: Hazard class and category code.

GHS Category:

Health	Environmental	Physical
Acute Oral Toxicity Category: 4 Reproductive toxicity Category :2 Specific target organ toxicity Category :1	Aquatic Toxicity – Category- NA	Flammable – Category NA

NA: Not available

Data reference: Official Journal of the European Union regarding EU GHS

Symbol – GHS07, GHS08

Details of statements:

Hazard Statements	H 302: Harmful if swallowed. H361: Suspected of damaging fertility or the unborn child H372: Causes damage to organs through prolonged or repeated exposure.
Precautionary Statement Prevention	P102: Keep out of reach of children. P103: Read label before use. P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P260: Do not breathe dust/fume/gas/mist/vapors/spray. P264: Wash ... thoroughly after handling. P270: Do not eat, drink or smoke when using this product. P281: Use personal protective equipment as required. P264: Wash exposed *parts of the body* thoroughly after handling. P270: Do not eat, drink or smoke when using this product.
Precautionary Statement Response	P101: If medical advice is needed, have product container or label at hand. P308+P313: IF exposed or concerned: Get medical advice/attention. P314: Get medical advice/attention if you feel unwell. P301+P312: IF SWALLOWED. Call a POISON CENTER or doctor/physician if you feel unwell. P330 Rinse mouth.
Precautionary Statement Storage	No storage statements
Precautionary Statement Disposal	Follow local regulation

Data reference: Official Journal of the European Union regarding EU GHS
https://pubchem.ncbi.nlm.nih.gov/compound/DI_Hydroxyethyl_ether#section=Safety-and-Hazards

Hazard ratings:

NFPA HAZARD CODES	RATINGS SYSTEM
HEALTH: 1	0 = No Hazard
FLAMMABILITY: 1	1 = Slight Hazard
INSTABILITY:	2 = Moderate Hazard
	3 = Serious Hazard
	4 = Severe Hazard

Data Reference:
https://pubchem.ncbi.nlm.nih.gov/compound/DI_Hydroxyethyl_ether#section=NFPA-Hazard-Classification

2.2 Information pertaining to particular dangers for human:

Irritating if inhaled. Irritating to eyes, skin and respiratory organs.

2.3 Information pertaining to particular dangers for the environment: NA

2.4 Other adverse effects:

Flammable and easily ignitable substance. Mixtures keep above ground and after ignition they spread fast into far distances. Ignition possible when exposed to hot surfaces, sparks, naked flames and by electrostatic discharges too.

Route of entry:

Those with history of lung diseases, or skin problems may be more susceptible to the effects of this substance. Those with history of lung diseases, or skin problems may be more susceptible to the effect of this material.

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
Yes	Yes	Yes	Yes	Yes

DATA REFERENCE: *https://pubchem.ncbi.nlm.nih.gov/compound/DI_Hydroxyethyl_ether*

Health hazards:

Source	NTP listed?	IARC cancer review group?	OSHA Regulated?
Carcinogenicity	No	No	No

DATA REFERENCE: Toxic release inventory (TRI) basis of Occupational Safety and Health Administration (OSHA) carcinogen, National Toxicological program (NTP), International Agency for Research on Cancer (IARC),

Section 3 – COMPOSITION & INFORMATION ON INGREDIENTS

Ingredients / Hazardous	CAS No.	EC No.	Percentage
Di Ethylene Glycol/Yes	111-46-6	203-872-2	99.80% min.
Acidity (As Acetic Acid) /Yes	64-19-7	200-580-7	0.003% max.
Mono Ethylene Glycol/Yes	107-21-1	203-473-3	0.2% (wt.) max.
Tri Ethylene Glycol/Yes	112-27-6	203-953-2	0.2% (wt.) max.

Section 4 – FIRST AID MEASURES

4.1 General advice

IMMEDIATE MEDICAL ATTENTION IS REQUIRED AFTER INHALATION OR AFTER SWALLOWING.

In case of health troubles or doubts, seek medical advice immediately and show this (Material) Safety Data Sheet.

4.2 Inhalation

Immediately leave the contaminated area; take deep breaths of fresh air. If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician, and be prepared to transport the victim to a hospital. Provide proper respiratory protection to rescuers entering an unknown atmosphere. Where possible, Self-contained breathing apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under protective clothing.

4.3 Skin contact
Wash off with soap and plenty of water. Get medical attention if symptoms occur.
4.4 Eye contact
Rinse thoroughly with plenty of water for at least 15 minutes. Get medical attention if symptoms occur.
4.5 Swallowing
Rinse mouth. If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration. Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Call a doctor if you feel unwell.

Section 5 – FIRE FIGHTING MEASURES

5.1 Suitable extinguishing media
Water in the form of spray, Alcohol resistant Foam, Dry chemical powder and CO2.
5.2 Extinguishing media to be avoided: Water in the form of Jet.
5.3 Caution about specific danger in case of fire and fire-fighting procedures: Danger of violent reaction or explosion. Vapours may travel considerable far distances and cause subsequent ignition. Vapours is heavier than air, may cumulate along the ground and in enclosed spaces – danger of explosion. Do not empty into drains. When burning, it emits carbon monoxide, carbon dioxide and irritant fumes. Containers with the substance exposed to excessive heat may explode.
5.4 Special protective equipment for fire-fighters
Wear full protective fire-resistant clothing and self-contained breathing apparatus.

Section 6 –ACCIDENTAL RELEASE MEASURES

6.1 Person-related safety precautions
Isolate hazard area. Evacuate all unauthorized personnel not participating in rescue operations from the area. Avoid entry into danger area. Remove all possible sources of ignition. Stop traffic and switch off the motors of the engines. Do not smoke and do not handle with naked flame. Use explosion-proof lamps and non-sparking tools. Avoid contact with the substance. Apply recommended full protective personal equipment. When escaping from the contaminated area, wear mask with cartridge against organic vapours. In case of general average, evacuate personnel from danger area.
6.2 Precautions for protection of the environment
Prevent from further leaks of substance.
6.3 Recommended methods for cleaning and disposal
Soak up residues with compatible porous material and forward for disposal in closed containers. Dispose off under valid legal waste regulations.

Section 7 –HANDLING AND STORAGE

7.1 Information for safe handling
Observe all fire-fighting measures (no smoking, do not handle with naked flame and remove all possible sources of ignition). Take precautionary measures against static discharges. Wear recommended personal protective equipment and observe instructions to prevent possible contact of substance with skin and eyes and inhalation. Avoid leak to environment.

7.2 Information for storage
Storerooms should meet the requirements for the fire safety of constructions and electrical facilities and should be in conformity with valid regulations. Store in cool, well-ventilated place with effective exhaust, away from heat and all sources of ignition. Store in tightly closed container. Do not store together with oxidizing agents.
Take precautionary measures against static discharges. Avoid leak to environment.
7.3 Information for specific use: NA.

Section 8 –EXPOSURE CONTROL & PERSONAL PROTECTION

8.1 Occupational Exposure Limits:

	ACGIH TLV-TWA 2021	ACGIH TLV-STEL 2021	OSHA – PEL	The Indian Factories Act – PEL 2021
Diethylene Glycol	NA	NA	NA	NA
Mono ethylene Glycol	NA	NA	NA	NA
Tri ethylene glycol	NA	NA	NA	NA

NA: Data not available

8.2 Occupational exposure controls
Collective protection measures: General and local ventilation, effective exhaust.
Individual protection measures: Personal protective equipment (PPE) for the protection of eyes, hands and skin corresponding with the performed labour has to be kept at disposition for the employees. In cases, where the workplace exposure control limits cannot be observed with the help of technical equipment or where it is not possible to ensure that the respiratory system exposure does not represent a health hazard for the personnel, adequate respiratory protection have to be kept at disposition. In the case of continuous use of this equipment during constant work, safety breaks have to be scheduled, if the PPE-character requires this. All PPE have to be kept in disposable state and the damaged or contaminated equipment has to be replaced immediately.
RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE):

HANDS	EYES	BODY	RESPIRATORY
			

Respiratory protection: If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-face piece respirator, airline hood, or full face piece self-contained breathing apparatus. protective mask with canister A (brown coloured, protecting against organic vapours), self-contained breathing apparatus. The respirator must be NIOSH approved and capable of reducing exposure below the occupational exposure limit in the interim until an engineering control is put in place.

Eye protection: Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.
Hand protection: Wear gloves of impervious material.
Body protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Protective coverall

antistatic design recommended, impervious when handling big amounts (nitrile rubber), sealed leather footwear (free from synthetic adhesives)
Hygiene Measures: Wash hands, forearms and face thoroughly after handling. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

8.3 Environmental exposure controls

Proceed in accordance with valid air and water legislative regulations and any other applicable requirements.
Engineering measures: Use only with adequate ventilation. If user operations generate dust, fumes, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended limits. The engineering controls also need to keep vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Section 9 –PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colourless Syrupy liquid
Odour	Odorless
Solubility in water	Miscible
Relative Density (H2O=1)	1.12 at 20 °C
Boiling Point °C	244°C - 245.8 °C
Melting Point °C	-6.5 to -10.5 °C
Relative Vapour Density (Air=1)	3.66
Flash point °C	154°C (Closed cup)
Auto ignition °C	364°C
Vapour pressure (kPa) @ 20 °C	0.0003
Molecular weight	106.12
Explosive limits in air % by volume	LEL 1.6% UEL12.2%
pH	NA
Viscosity cP @20 °C	35.7
Pour point	NA
Evaporation rate (water=1)	NA
Octanol/water partition coefficient log Kow	NA
% volatile	NA

NA: NOT AVAILABLE
DATA REFERENCE *http://toxnet.nlm.nih.gov/cgi-bin/sis/search*

Section 10 –CHEMICAL STABILITY AND REACTIVITY INFORMATION

10.1 Conditions to avoid

Prolonged exposure of containers or tank cars to heat or fire may cause the material to expand with possible container rupture

10.2 Material to avoid

AIR AND WATER REACTIONS:
Oxidizes readily in air to form unstable peroxides that may explode spontaneously [Bretherick, 1979 p.151-154, 164]. A mixture of liquid air and diethyl ether exploded spontaneously, [MCA Case History 616(1960)]. Water soluble.
A violent explosion occurred when lithium aluminum hydride was being used to dry diethylene glycol dimethyl ether. The ignition may have occurred due to the presence

of large amounts of water or perhaps peroxide formed in the ether. About 75% of the ether had been removed when the explosion occurred, [MCA Case History 1494 1968)].
REACTIVE GROUPS: Ethers, Very dangerous fire hazard when exposed to oxidizers
10.3 Hazardous decomposition products
Thermal decomposition generates carbon monoxide and carbon dioxide.
Polymerization: Polymerization occurs if heated in sunlight or presence of air; reaction is exothermic.

Section 11 –TOXICOLOGICAL INFORMATION

Information on Toxicological Effects

11.1 Acute Toxicity:
Di Ethylene Glycol: LD50 – Oral rat – 12565 mg/kg
11.2 Skin corrosion/irritation: No data available
11.3 Serious eye damage/irritation: No data available
11.4 Respiratory or skin sensitization: No data available
11.5 Germ cell mutagenicity: No data available
11.6 Carcinogenicity: No data available
11.7 Reproductive toxicity: YES – Oral rat - 76420 mg/kg (6-15D pregnant) Reproductive: Effects on embryo or fetus: Fetotoxicity (except death, e.g., stunted fetus)
11.8 STOT- Single exposure: No data available
11.9 STOT- Repeated exposure: No data available
11.10 Aspiration hazard: No data available
Data Reference:
https://pubchem.ncbi.nlm.nih.gov/compound/DI_Hydroxyethyl_ether#section=Toxicity

Section 12 –ECOLOGICAL INFORMATION

12.1 Eco toxicity data:

Parameter	Route	Species	Values	Exposure period
LC50	Inhalation	Daphnia magna	10000000 ug/L	24 Hours
LC50	Inhalation	Carassius Auratus (Gold Fish)	5000000 ug/L	24 Hours

Data Reference:
https://pubchem.ncbi.nlm.nih.gov/compound/DI_Hydroxyethyl_ether#section=Ecotoxicity-Values
12.2 Mobility: Is expected to have very high mobility in soil.
Data Reference:
https://pubchem.ncbi.nlm.nih.gov/compound/DI_Hydroxyethyl_ether#section=Environmental-Fate-Exposure-Summary
12.3 Persistence and degradability: Hydrolysis is not expected to be an important environmental fate process since this compound lacks functional groups that hydrolyze under environmental conditions. Substance is biodegradable.
12.4 Bio accumulative potential: Potential for bio concentration in aquatic organisms is low.
12.5 Results of PBT assessment Persistence and Degradation: NA

12.6 Other adverse effects: NA
Environmental Fate: Di Ethylene Glycol is expected to have high mobility in soil, Volatilization from water surfaces is expected.

Section 13– DISPOSAL CONSIDERATION

Local Legislation: Disposal should be in accordance with applicable regional, national, and local laws and regulations. This product should not be dumped, spilled, rinsed or washed into sewers or public waterways.

13.1 Recommended disposal methods for the substance / preparation
Product reuse or disposal in accordance with valid waste legislative regulations.

13.2 Recommended disposal methods for contaminated packaging
Product is transported in drums / tank-vehicles.

13.3 Waste management measures that control exposure of humans and environment
Proceed in accordance with valid health, air and water legislative regulations.

13.4 Waste regulation: Follow local regulation.

Section 14– TRANSPORT INFORMATION

International Transport Regulation:
ADR/RID (Road/Rail), IMDG (Sea) and ICAO/IATA (Air)
The product is not regulated

14.1

Proper Shipping Name:	Not classified
Hazard Class:	Not classified
UN Number:	Not classified
Emergency Action Code:	Not classified

14.2 Special transport precautionary measures
Not applicable.

Section 15– REGULATORY INFORMATION

(M)SDS format on a 16 Section based on guidance provided in:

Indian Regulation:
Manufacture, Storage and Import of Hazardous Chemicals Rule, 1989.
The Factories Act 1948

International Regulations:
European SDS Directive
ANSI MSDS Standard
ISO 11014-1 1994

WHMIS Requirements
United States
Hazard Communication Standard
Canada
Hazardous Products Act and Controlled Products Regulations
Europe
Dangerous Substance and Preparations Directives
Australia
National Model Regulations for the Control of Workplace Hazardous Substances

The Globally Harmonized System of Classification and Labeling of Chemicals endorsed by The UN Economic and Social Council

Section 16 – OTHER INFORMATION

Training instructions
Personnel handling the product has to be acquainted demonstrably with its hazardous properties, with health and environmental protection principles related to the product and first aid principles.
Tremcard details/Reference: Refer Section 14
Local bodies involved (Applicable only with in India): Local District Authorities and Local Crisis Group

Sources of data used to compile the (Material) Safety Data Sheet
Data compilation reference: National Institute for Occupational Safety and Health guide to chemical hazards and International Chemical Safety Cards (WHO/IPCS/ILO) and
https://pubchem.ncbi.nlm.nih.gov/compound/DI_Hydroxyethyl_ether .,
http://www.cdc.gov/niosh/npg/npgd0049.html,
Data reference: Official Journal of the European Union regarding EU GHS

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Aug. 01, 2013	Section 2 NFPA Hazard statement	Sep. 01, 2011
April 01,2016	Section 2,11,12	Aug. 01, 2013
Jan.01,2019	Section 1 Jamnagar Manufacturing Division	April 01,2016
Jan 10, 2022	Section 1, 2, 3, 4, 5, 8, 11, 12, 13	Jan 01, 2019

This (M)SDS is issued by the Centre for HSE Excellence, Reliance Industries Limited

Contact Details: For any enquiry/comment regarding this (Material) Safety Data Sheet, kindly contact the Centre for HSE Excellence at HSE.ExcellenceCentre@ril.com

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